

COMMERCIAL STANDARD CS98-62

ARTISTS' OIL PAINTS

Supersedes CS98-42

**A recorded
voluntary standard of the
trade published by
the U.S. Department
of Commerce**



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DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
OFFICE OF STANDARDS SERVICES

COMMERCIAL STANDARD CS98-62
ARTISTS' OIL PAINTS

Commercial Standard CS98-62, Artists' Oil Paints, was withdrawn by the Department of Commerce in 1982.

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The following ASTM standards may be used:

ASTM D4236, Standard Practice Labeling Art Materials for Chronic Health Hazards,

ASTM D4302, Specification for Artists' Oil, Resin-Oil, and Alkyd Paints,

ASTM D4303, Test Methods for Relative Lightfastness of Pigments Used in Artists' Paints

These standards are the under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings and Materials and the direct responsibility of Subcommittee D01.57 on Artist Paints and Related Materials.

The Committee can provide further assistance, additional information on standards and/or contacts for subcommittee.

Contact: Committee D01 Staff Manager
American Society for Testing and Materials (ASTM)
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The Art & Craft Materials Institute (ACMI) can provide further assistance on such as nontoxicity and chronic hazard labelling for art and craft materials; certified products; individual product standards and/or additional information.

Contact: Art & Craft Materials Institute (ACMI)
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U.S. DEPARTMENT OF COMMERCE

OFFICE OF TECHNICAL SERVICES

Commodity Standards Division

With the cooperation of the
National Bureau of Standards

EFFECTIVE DATE

Having been passed through the regular procedures of the Commodity Standards Division, and approved by the acceptors hereinafter listed, this Commercial Standard is issued by the U.S. Department of Commerce, effective November 15, 1962.

LUTHER H. HODGES, *Secretary.*

COMMERCIAL STANDARDS

Commercial Standards are developed by manufacturers, distributors, and users in cooperation with the Commodity Standards Division of the Office of Technical Services and with the National Bureau of Standards. Their purpose is to establish quality criteria, standard methods of test, rating, certification, and labeling of manufactured commodities, and to provide uniform bases for fair competition.

The adoption and use of a Commercial Standard is voluntary. However, when reference to a Commercial Standard is made in contracts, labels, invoices, or advertising literature, the provisions of the standard are enforceable through usual legal channels as a part of the sales contract.

Commercial Standards originate with the proponent industry. The sponsors may be manufacturers, distributors, or users of the specific product. One of these three elements of industry submits to the Commodity Standards Division the necessary data to be used as the basis for developing a standard of practice. The division by means of assembled conferences or letter referenda, or both, assists the sponsor group in arriving at a tentative standard of practice and thereafter refers it to the other elements of the same industry for approval or for constructive criticism that will be helpful in making any necessary adjustments. The regular procedure of the division assures continuous servicing of each Commercial Standard through review and revision whenever, in the opinion of the industry, changing conditions warrant such action.

SIMPLIFIED PRACTICE RECOMMENDATIONS

Under a similar procedure the Commodity Standards Division co-operates with industries in the establishment of Simplified Practice Recommendations. Their purpose is to eliminate avoidable waste through the establishment of standards of practice for sizes, dimensions, varieties, or other characteristics of specific products; to simplify packaging practices; and to establish simplified methods of performing specific tasks.

The initial printing of this Commercial Standard was made possible through the cooperation of the following manufacturers in ordering advance copies:

Bocour Artists Colors, Inc., New York, N.Y.
The Craftint Manufacturing Co., Cleveland,
Ohio
M. Grumbacher, Inc., New York, N.Y.
Permanent Pigments, Inc., Norwood, Ohio

Sargent Art Materials, Inc., New York, N.Y.
Shiva Artists Colors, Chicago, Ill.
Talens & Son, Inc., Union, N.J.
F. Weber Co., Philadelphia, Pa.
Winsor & Newton, Inc., New York, N.Y.

Artists' Oil Paints

(Effective November 15, 1962)

1. PURPOSE

1.1 The purposes of this Commercial Standard are to serve as a guide to artists in the purchase of paints of satisfactory color, working quality, and durability; to eliminate confusion in nomenclature; to promote fair competition among manufacturers by providing criteria for differentiation among paints of known satisfactory composition and others of unknown or inferior quality, and thus to provide a basis for certification of quality.

This Commercial Standard covers minimum requirements for artists' oil paints of satisfactory color and durability. It is not intended that all paints meeting the requirements shall be identical nor of uniform excellence in all respects. Variations in manufacture and grinding not controlled by the specification may cause some artists to prefer one brand over another, both of which are acceptable under this specification.

2. SCOPE

2.1 This Commercial Standard covers one grade of artists' oil paints and includes criteria of color, nomenclature, chemical composition, working qualities, light fastness, and performance. It also covers methods of testing to demonstrate conformance with the standard, packaging and a means for labeling and identification.

3. NOMENCLATURE

3.1 The paint names given in table 1 indicate the chemical nature of the pigment or are those which, through usage, have become associated with that pigment. The use of these names for similarly colored pigments is not permitted by this standard.

4. GENERAL REQUIREMENTS

4.1 **Pigments** shall be of good grade. Composition and identity shall conform to those listed in table 1. Organic lakes or toners shall not be used to fortify or sophisticate inorganic pigments. Substitution of similarly colored pigments is not permitted.

4.2 **Vehicles** shall consist of pure drying oils; linseed and/or poppy oil only.

4.3 **Driers** may be used in minimum amounts in paints that contain pigments which have a retarding effect on the drying of oils, to allow them to conform to drying rate requirements (par. 4.4). The maximum amount of drier, however, shall not exceed 0.1 percent of cobalt or 0.2 percent of manganese, calculated as metal, on the weight of oil.

4.4 **Drying rate** shall be determined by the sand- and pressure-

testing devices. Paints shall dry to both tests within 21 days and not under 3 days at 23° C. and 50 percent relative humidity. (See par. 6.3.)

4.5 **Consistency** of artists' oil paints shall be determined by use of a standard 2-kg Paste Paint Consistometer. Readings between 2 and 5 will be acceptable under this standard. (See par. 6.5.)

4.6 **Brushing** quality of artists' oil paints shall be determined by observing the handling quality of the paint when manipulated with a brush. All artists' oil paints shall brush out smoothly, evenly and easily, leaving a normal brush mark. They shall not be sticky, thick or rubbery, nor too fluid. There shall be no free or excess oil. They shall not contain skin and shall be uniformly ground. They shall retain their form and shall not level out when applied with a palette knife. (See par. 6.6.)

4.7 **Tinting strength** of artists' oil paints shall not be less than that of the standard adopted for each pigment. (See par. 6.7.)

4.8 **Composition** of the paint, governed by the relative amounts of vehicle, pigment, and inert used, shall produce a paint of satisfactory working qualities, conforming to all requirements of this Commercial Standard.

4.9 **Inerts and fillers** shall not be used as extenders, reducers, or diluents.

4.10 **Bodying agents**, such as metallic soaps and/or refined beeswax, may be used only in minimum amounts to produce desirable working qualities, consistency, and to prevent settling of pigment.

5. DETAIL REQUIREMENTS

5.1 **Light fastness.**—All pigments included in table 1 have been shown to resist fading satisfactorily when used in oil painting and under normal conditions of exposure. No accelerated method of testing for light fastness has been found to be directly comparable with normal use conditions, but for purposes of test, exposure to sunlight under specified conditions has been found to be of some value as a means of grouping paints on the basis of fastness under test conditions. (See par. 6.4.) The grouping of pigments covered by this commercial standard, when painted in oil on nonabsorbent supports and unmixed with other pigments, is shown in table 1.

5.1.1 Group 1 paints shall resist fading at full concentration when exposed to direct sunlight at southern exposure under glass at 45° angle for 2 months. This shall include at least 600 hours of sunlight, as shown by weather reports from the nearest U.S. Weather Bureau station.

5.1.2 Group II paints shall resist fading to direct sunlight under the above conditions for 1 month. This shall include at least 300 hours of sunlight.

5.1.3 The above tests shall be made in the period from April 1 to October 1 of any given year. If this method is impractical, or in case of dispute, the paint shall be tested under conditions agreed upon by all parties concerned, but in no case shall their severity be less than specified above either in respect to numbers of hours of direct sunlight or duration of the exposure.

5.2 Names under which artists' oil paints conforming to this Commercial Standard are sold, the pigments used in their composition,

and the light-fastness group of each, shall conform to table 1, glossary of terms. Only paints whose labels and contents conform to the nomenclature and composition as indicated in the glossary of terms and in paragraph 5.2.1 are acceptable.

5.2.1 Special considerations.—The following general practices of the trade in labeling artists' oil paints are permissible:

1. Descriptive adjectives such as pale, light, lightest, medium or deep may be added after paint names.
2. Manufacturers may supply white paint under a "trademark" name, provided the label indicates the pigments used.
3. Proprietary names may be used for Phthalocyanine blue and Phthalocyanine green, provided the standard designation appears on the tube label in parentheses under the proprietary name.

5.2.2 New materials under study.—In line with developments in the industry, pigments are under consideration for possible future acceptance as standard colors, pending additional investigation and testing. Those currently in this group are listed in Table 2.

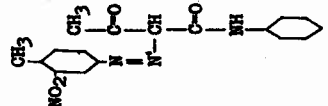
5.3 Containers.—Artists' oil paints shall be packed in tubes made of a suitable metal.

5.3.1 Standard size tubes shall be approximately 2.5 x 10 cm overall and shall contain not less than 37 ml of paint.

Table 1. -- Standard paints -- glossary of terms

Paint name	Pigment ^{1/}	Test group (see par. 5.1)
Alizarin crimson.....	Pigment made from 1-2-dihydroxy anthraquinone and aluminum hydroxide.	I
Burnt sienna.....	Iron oxide prepared by calcining the natural earth, raw sienna.	I
Burnt umber.....	Iron oxide and manganese dioxide pigment prepared by calcining raw umber.	I
Cadmium orange.....	CP cadmium sulfide, CdS, or cadmium sulfoselenide, CdS + CdSe	I
Cadmium-barium orange.....	Cadmium sulfide, CdS, or cadmium sulfoselenide, CdS + CdSe, coprecipitated with barium sulfate.	I
Cadmium red, deep.....	CP cadmium sulfoselenide, CdS + CdSe	I
Cadmium red, medium.....		
Cadmium red, light.....		
Cadmium-barium red, deep.....	Cadmium sulfoselenide coprecipitated with barium sulfate, CdS + CdSe + BaSO ₄	I
Cadmium-barium red, medium....		
Cadmium-barium red, light.....		
Cadmium yellow, deep.....	CP cadmium sulfide, CdS	I
Cadmium yellow, medium.....		
Cadmium yellow, light.....		
Cadmium-barium yellow, deep...	Cadmium sulfide coprecipitated with barium sulfate, CdS + BaSO ₄	I
Cadmium-barium yellow, medium..		
Cadmium-barium yellow, light..		
Cerulean blue.....	Combined oxides of cobalt and tin, CoO·nSnO ₂	I

Table 1. -- Standard paints -- glossary of terms

Paint name	Pigment ^{1/}	Test group (see par. 5.1)
Chromium oxide green.....	Anhydrous chromic oxide, Cr_2O_3	I
Cobalt blue.....	Combined oxides of cobalt and aluminum, $\text{CoO} \cdot \text{Al}_2\text{O}_3$	I
Cobalt green.....	Combined oxides of zinc and cobalt, $\text{CoO} \cdot n\text{ZnO}$	I
Cobalt violet.....	Anhydrous cobalt phosphate, $\text{Co}_3(\text{PO}_4)_2$, or arsenate, $\text{Co}_3(\text{AsO}_4)_2$	I
Cobalt yellow.....	Potassium cobaltinitrite, $\text{CoK}_3(\text{NO}_2)_6 \cdot \text{H}_2\text{O}$	II
Flake white.....	Basic lead carbonate, $2\text{PbCO}_3 \cdot \text{Pb}(\text{OH})_2$	I
Green earth.....	Natural earth consisting chiefly of the hydrous sili- cates of iron, aluminum, magnesium, and potassium.	I
Hanza yellow.....	Pigments based on a coupling of a substituted phenyl amine with an aceto-acetarylide. The three approved pigments are listed in the Color Index as follows: Hanza yellow G - CI pigment yellow 1 (CI 11680). Hanza yellow 5 G - CI pigment yellow 5 (CI 11660). Hanza yellow 10 G - CI pigment yellow 3 (CI 11710). Typical structural formula:	I
		
Indian red (bluish shade)...	Nearly pure iron oxide Fe_2O_3 . It may be either natural or artificial in origin.	I
Ivory black	Amorphous carbon produced by charring animal bones.	I

5.3.2 When smaller size tubes are required, they shall be approximately 1.3 x 10 cm overall, containing not less than 10 ml, or approximately 1.3 x 5 cm overall, containing not less than 5 ml.

5.3.3 White paint may be packed in tubes approximately 3.8 x 15 cm overall, containing not less than 150 ml and in tubes approximately 2.5 x 15 cm overall, containing not less than 62 ml.

6. METHODS OF TEST

6.1 **Sampling.**—The contents of a previously unopened tube of paint shall be completely emptied on a glass slab and mixed thoroughly with a spatula in order to obtain a homogeneous sample.

6.2 **Pigments** generally may be identified by the usual methods of analysis and identification of inorganic and organic compounds.

6.3 **Drying rate.**—Apparatus, preparation of samples, schedule, procedure and interpretation are given below.

Table 1. -- Standard paints -- glossary of terms

Paint name	Pigment ^{1/}	Test group (see par. 5.1)
Lamp black.....	A nearly pure amorphous form of carbon made from the condensed smoke of a luminous flame.	I
Light red (scarlet shade)	Nearly pure iron oxide, Fe_2O_3	I
Manganese blue.....	Barium manganate with barium sulfate, $\text{BaMnO}_4 + \text{BaSO}_4$	I
Manganese violet.....	Manganese ammonium phosphate, MnNH_4PO_4	I
Mars black.....	Ferro-ferric oxide, $\text{Fe}_2\text{O}_3 + \text{FeO}$	I
Mars brown.....	Artificial ochre consisting chiefly of iron and manganese oxides, $\text{Fe}_2\text{O}_3 + \text{MnO}_2$	I
Mars orange.....	Artificial ochre, consisting chiefly of iron and aluminum oxides, $\text{Fe}_2\text{O}_3 + \text{Al}_2\text{O}_3$	I
Mars red.....	Artificial ochre, consisting chiefly of iron and aluminum oxides, $\text{Fe}_2\text{O}_3 + \text{Al}_2\text{O}_3$	I
Mars violet.....	Artificial iron oxide, Fe_2O_3	I
Mars yellow.....	Artificial ochre consisting chiefly of hydrous oxide of iron and aluminum, $\text{Fe}_2\text{O}_3 \cdot n\text{H}_2\text{O} + \text{Al}_2\text{O}_3 \cdot n\text{H}_2\text{O}$	I
Mixed white.....	Mixture of zinc white, ZnO , and white lead, $2\text{PbCO}_3 \cdot \text{Pb}(\text{OH})_2$, percentages to be declared on label.	I
Naples yellow.....	Lead antimoniate, essentially $\text{Pb}_3(\text{SbO}_4)_2$	I
Phthalocyanine blue.....	Pigment made from a synthetic organic dyestuff, which is copper phthalocyanine.	I
Phthalocyanine green....	Pigment made from a synthetic organic dyestuff, which is chlorinated copper phthalocyanine.	I
Prussian blue.....	Ferric ferrocyanide, $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$	I
Raw sienna.....	Natural earth that consists chiefly of the hydrous silicates and oxides of iron and aluminum.	I
Raw umber.....	Natural earth that consists chiefly of the hydrous oxides and silicates of iron and manganese.	I

6.3.1 Suggested apparatus.—

- (1) Humidity- and temperature-controlled test room maintaining approximately 23°C temperature and 50-percent relative humidity.
- (2) Sand testing apparatus. (See fig. 1.)
- (3) Pressure testing apparatus. (See fig. 2.)
- (4) Bronze template 0.25 mm in thickness, for use on 7.5 x 12.5 cm test panels. (See below.)
- (5) 7.5 x 12.5 cm glass panels (window glass thickness).
- (6) 2-ml measuring ring.
- (7) Doctor blade.
- (8) 50-ml Burette.
- (9) Palette knife.
- (10) Glass or marble mixing slab.

6.3.2 Preparation of test panels.—Two ml of the paste paint are measured out in the ring and placed on the test plate; 1/5 ml of turpentine is added from a burette or graduated syringe and thoroughly

mixed with the paste with a palette knife. The thinned paint is spread out on the glass panel to 0.25 mm in thickness with the aid of the template and a doctor blade.

6.3.3 Schedule.—All tests are to be conducted in the controlled test room, and the specimens are to remain there until the tests are completed. The first test is to be made at the end of 3 days (72 hours) and the second at the end of 21 days (504 hours) after the paint has been applied and the sample has been deposited in the test room.

6.3.4 Procedure and interpretation.—

(1) Surface drying rates shall be tested with the sand-type instrument (fig. 1), which permits 1g of sand to flow over the painted surface held at an angle 45° with the vertical. For incidental tests, if this instrument is not available, sand may be poured by hand from a teaspoon. Sand shall not stick to the film nor leave a visible mark.

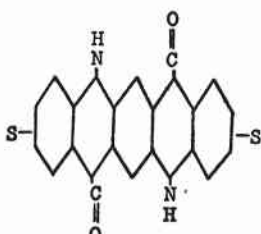
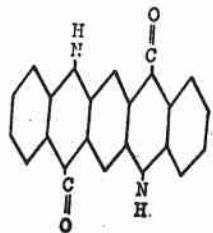
(2) Film-drying rate shall be tested with the pressure-type instrument (fig. 2), by which a 200-g weight is applied. For incidental tests, an ordinary metal ring with a sharp edge (like a wedding ring), pressed on the paint film by a 200-g weight may be used. The ring shall leave no visible mark on the film.

Table 1. -- Standard paints -- glossary of terms

Paint name	Pigment ^{1/}	Test group (see par. 5.1)
Rose madder.....	The synthetic red organic dye-stuff 1,2-dihydroxyanthraquinone precipitated on a base of aluminum hydrate.	I
Strontium yellow.....	Strontium chromate, SrCrO ₄	II
Titanium white.....	A white containing at least 30 percent of titanium dioxide, TiO ₂ , and free from lead, balance either BaSO ₄ and/or ZnO	I
Ultramarine blue.....	Complex silicate of sodium and aluminum with sulfur.	I
Ultramarine green.....	Complex silicate of sodium and aluminum with sulfur.	II
Ultramarine red.....	Complex silicate of sodium and aluminum with sulfur.	I
Venetian red.....	Artificial or natural iron oxide with varying proportions of inert.	I
Vermilion.....	Mercuric sulfide, HgS. Can be designated as English, French or Chinese.	II
Viridian.....	Hydrous chromic oxide, Cr ₂ O ₃ ·2H ₂ O	I
Yellow ochre.....	Artificial or natural mixture of hydrous iron oxide with alumina and silica.	I
Zinc white.....	Zinc oxide, ZnO	I

^{1/} There is no claim that all the pigments listed in Table 1 are stable and desirable under all conditions. The list at present includes only the better known and more stable pigments. It is to be understood that the chemical formulas used in the tables are not intended to indicate the exact chemical composition of the pigments but rather their approximate or substantial composition. It is recognized that in the preparation of certain pigments it is often necessary to incorporate modifying materials which are not to be regarded as fillers, extenders, or adulterants.

Table 2. -- New Materials under study

Paint name	Pigment
<u>Typical structural formula</u>	
Cadmium-vermillion reds Light, medium-light, medium, dark and maroon.	Cadmium-mercury sulphides
Quinacridones Quinacridone Magenta	Pigments made from linear quinacridone compounds as follows: 
Quinacridone Red, blue shade Quinacridone Red, yellow shade Quinacridone Violet	

6.4 **Light fastness.**—Shall be determined in an out-of-door (roof) exposure rack.

6.4.1 The exposure rack shall be constructed to hold panels at a 45° angle to southern exposure. The specimen shall be protected from rain and dirt by glass windows placed not less than 5 cm from the surface of the specimen. The windows shall be kept clean throughout the test. No obstruction shall interfere with exposure to full sunlight at all times of the day.

6.4.2 Support for exposure tests shall be smooth opaque white, or opal, glass. Two specimen panels at least 7.5 x 12.5 cm in size shall be prepared by brushing out the paint as it comes from the tube without addition of thinner. In referee tests, a Bird applicator giving a film thickness of 0.075 mm shall be used. When dry, but not before 1 week, one specimen is placed in the exposure rack and left for a period conforming to its light-fastness group (see par. 5.1).

The control panel shall be kept in diffused light during the period. The extent of fading shall be judged by comparison of the exposed panel with the control panel. A suitable varnish may be applied to differentiate between fading and chalking.

6.5 **Consistency** is measured with an instrument by which the paste paint is deformed under pressure.

6.5.1 **Equipment**

- (1) Brass template approximately 4 inches square and 6.3 mm thick with centered hole (diameter 2.0 cm) to contain 2.0 ml of paint.
- (2) Glass plate with eight concentric circles, numbered from 0 to 7 with radii 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5 cm respectively. The innermost circle corresponds to the center hole in the brass template. The chart is drawn on paper and glued to the back of the glass.
- (3) Wooden frame for housing template and glass.
- (4) Palette knife for applying paint to template.
- (5) Two-kg weight.
- (6) Glass plate for placing on top of paint after template has been removed.

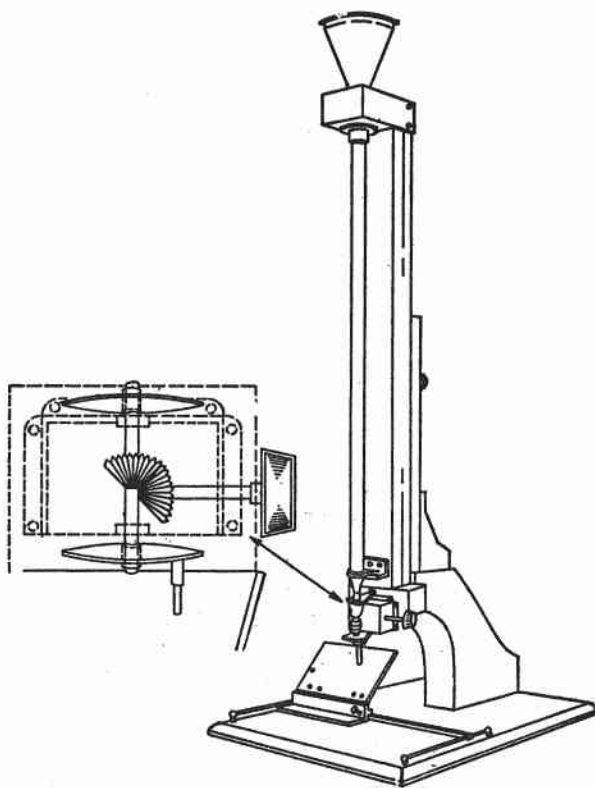


Figure 1. - Sand-type machine for drying-rate test.

For description and close-up photograph, see H. A. Gardner: Physical and Chemical Examination of Paints, Varnishes, Lacquers and Colors, 11th edition, page 156. Institute of Paint and Varnish Research, Washington, D. C. (1950)

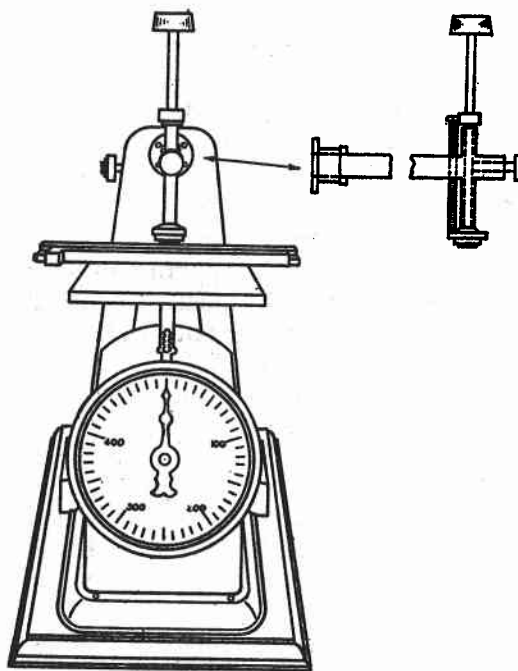


Figure 2 - Pressure-type machine for drying-rate test

For description and close-up photograph, see H. A. Gardner: *Physical and Chemical Examination of Paints, Varnishes, Lacquers and Colors*, 11th edition, page 167. Institute of Paint and Varnish Research, Washington, D. C. (1950)

6.5.2 Procedure.—Place the glass plate with concentric rings face up in the bottom of the wooden frame. Place brass template over glass plate; if no frame or housing is used be sure the template is centered. Fill hole of template with paint to be tested and level off. Lift template from plate, take the plain glass plate and lay on the paint and apply evenly the 2-kg weight, allowing it to stand until the paint has ceased to spread. Paint of proper consistency shall spread over the number 2 ring and not over the number 5 ring.

6.6 Brushing quality.—This quality shall be determined by technicians skilled in the use of artists' oil paints. The characteristics of the paint shall be observed so as to determine its conformity with paragraph 4.6. The following descriptive terms denoting certain qualities of particular significance to artists shall be used in accordance with the definition given:

Smooth, describes a paint which spreads evenly and easily, leaving a normal brush mark.

Sticky or tacky, describes a paint which is thick, viscous, or rubbery, and difficult to apply.

Fluid, describes a paint which flows too rapidly for correct handling. Paints very fluid in character leave few or no brush marks, and when applied in impasto, lose form and "level out." Any change in the leveling of paint over a period of 24 hours should be observed.

6.6.1 If the determination of brushing quality made by a single technician is questioned, determinations shall be made by each of three technicians acceptable to the parties concerned. The three technicians shall be in agreement that the brushing quality is in conformity with paragraph 4.6; otherwise, the paint shall not be considered as meeting this standard.

6.7 Tinting strength

6.7.1 Suggested equipment

- (1) Syringe, template, measuring ring or other suitable device for volumetric reduction of paste paints, 20:1 and 10:1.
- (2) Glass slab for use in mixing the pastes.
- (3) Spatula (paint knife) for mixing.
- (4) Reflectometer (or other suitable colorimetric device) for determination of reflectance.*

6.7.2 **Materials.**—Zinc oxide standard reduction paste made from the following formulas as outlined by the Federation of Paint and Varnish Production Clubs, Official Digest, No. 120, p. 1029 (November 1932) and published in H. A. Gardner's "Physical and Chemical Examination of Paints, Varnishes, Lacquers, and Colors," 11th Edition, p. 40 (1950).

300 parts by weight Green Seal zinc oxide.

64 parts by weight poppy seed oil.

2 parts by weight calcium stearate.

1 part by weight turpentine.

6.7.2.1 If, for certain uses, it is found that the above reduction paste dries too slowly, it is permissible to add 0.213 part by weight of 6-percent cobalt naphthenate drier to give 0.02 percent of metallic cobalt based on the weight of the oil.

6.7.3 **Procedure.**—Reduce 1 volume of the paint to be tested with 20 volumes of the standard reduction paste. Mix thoroughly with a spatula on glass slab. (The tinting-strength tests for Green Earth and Ultramarine Red, and Cobalt Violet, are made by reduction with standard reduction paste 10:1. The tinting-strength standards of paints made with these pigments have been made by 10:1 reduction instead of 20:1 because they have inherently low tinting strength). Paint out or spread out the reduced paint on a test panel of suitable material to a thickness adequate to produce total opacity. After drying, the daylight reflectance (CIE illuminant source C) at 45° shall be determined by means of a device such as specified in paragraph 6.7.1. The value obtained should not exceed the "Y" values in table 3 by a relative value of greater than 10 percent in reflectance. Only the Y and VALUE columns are to be considered in making tinting-strength observations; the columns, X, Z, HUE and CHROMA are given in table 3 as general information. The tristimulus values in table 3 were obtained in 1951 from the original master set of tinting-strength standards on file in the National Bureau of Standards. These color swatches were in force as standards from May 10, 1942, until they were superseded by this paragraph January 1, 1952.

*Such as the Hunterlab D 40 Reflectometer.

TABLE 3. TINTING STRENGTH STANDARDS *

PAINT NAME **	Tristimulus Values			Munsell Notation		
	X	Y	Z	Hue	Value	Chroma
Alizarin Crimson	42.0	31.0	34.2	6.0RP	5.7	10.0
Burnt Sienna	39.8	34.5	22.4	2.5YR	6.2	4.5
Burnt Umber	31.4	30.0	24.8	6.5YR	5.8	3.0
Cadmium Orange	55.9	46.0	17.7	2.5YR	7.3	9.5
Cd-Ba Orange	61.2	57.0	31.3	7.5YR	8.0	7.5
Cadmium Red, Deep	30.8	24.0	28.6	9.0RP	5.2	5.5
Cadmium Red, Medium	40.8	30.0	20.7	4.0R	5.8	10.0
Cadmium Red, Light	50.9	40.0	24.2	7.5R	7.0	10.0
Cd-Ba Red, Deep	38.8	32.0	33.6	9.0RP	6.0	5.0
Cd-Ba Red, Med.	41.4	31.5	24.8	4.0R	6.0	9.0
Cd-Ba Red, Light	51.4	39.0	24.8	7.0R	7.0	12.0
Cd Yellow, Deep	60.4	57.5	18.3	9.0YR	7.8	9.0
Cd Yellow, Med.	65.1	67.5	17.7	4.0Y	9.0	12.0
Cd Yellow, Light	66.4	74.5	21.2	8.0Y	9.2	9.0
Cd-Ba Yellow, Deep	63.9	62.5	25.4	1.0Y	8.2	8.0
Cd-Ba Yellow, Medium	67.9	71.0	25.4	4.0Y	9.2	9.5
Cd-Ba Yellow, Light	69.6	77.5	34.2	8.5Y	9.2	7.5
Cerulean Blue	50.8	55.0	81.4	1.0PB	8.2	4.5
Cobalt Blue	43.6	45.0	83.8	3.5PB	7.2	8.0
Cobalt Green	58.9	63.0	73.8	1.0B	8.2	1.3
Cobalt Violet	55.3	49.5	76.7	2.5P	7.4	5.5
Cobalt Yellow	69.2	74.0	47.2	7.5Y	9.3	5.0
Green Earth	58.4	62.5	68.4	9.0BG	8.2	1.3
Indian Red	25.6	21.5	21.2	1.0R	5.2	4.5
Ivory Black	32.0	33.0	41.9	5.0PB	6.6	0.4
Lamp Black	13.9	14.0	20.1	5.0PB	4.2	1.3
Light Red	33.6	27.0	20.7	6.0R	5.7	6.0
Manganese Blue	52.9	59.0	87.3	7.0B	8.1	6.0
Mars Violet	24.1	22.0	26.6	2.5RP	5.1	2.5
Mars Yellow	55.5	55.0	28.3	1.0Y	7.8	6.5
Phthalocyanine Blue	16.2	17.0	56.1	3.5PB	4.6	14.0
Phthalocyanine Green	18.0	26.0	39.5	7.5BG	5.3	8.0
Prussian Blue	15.4	16.0	46.0	4.5PB	4.2	10.5
Raw Sienna	55.0	54.0	37.8	1.0Y	7.6	4.5
Raw Umber	41.9	42.5	38.4	1.5Y	6.9	2.0
Rose Madder	63.5	57.5	67.3	2.5RP	7.4	6.0
Strontium Yellow	72.7	79.0	54.3	10.0Y	9.3	5.0
Ultramarine Blue	35.8	36.0	79.7	5.0PB	6.3	10.0
Ultramarine Green	56.2	59.5	78.5	1.0PB	8.2	2.5
Ultramarine Red	56.1	50.5	69.0	0.4RP	7.3	7.0
Venetian Red	27.7	21.5	13.6	7.0R	5.0	6.0
Vermilion, English	49.7	37.5	26.6	5.5R	6.4	10.0
Vermilion, Chinese	50.9	42.0	42.5	10.0RP	6.9	9.5
Viridian	41.8	49.5	64.3	7.5BG	7.3	4.5
Yellow Ochre	67.2	67.5	49.6	1.5Y	8.7	5.0

* Tinting strength standards for the following pigments have not yet been established:

Chromium oxide green	Mars black	Mars red
Hansa yellow	Mars brown	Naples yellow
Manganese violet	Mars orange	

** For a detailed description of the ISCC-NBS color names for these paints reference may be made to NBS Circular 553, The Inter Society Color Council - National Bureau of Standards, Method of Designating Colors and a Dictionary of Color Names, by Kenneth L. Kelly and Deane B. Judd. Available from Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C., at \$2 per copy.

7. LABELING

7.1 Labeling of artists' oil paints shall indicate the following:

7.1.1 The complete paint name, indicating pigment composition in conformance with the standard nomenclature in the glossary of terms (tables 1 and 2, pars. 5.2 and 5.2.1) shall be clearly printed on one side of the tube in letters of equal size and importance. Subtitles, which are permitted in paragraph 5.2.1, shall appear in smaller type and in parentheses directly under the paint name.

7.1.2 Contents expressed in millileters.

7.1.3 The guarantee of conformance to the Commercial Standard.

8. IDENTIFICATION

8.1 In order that purchasers may be assured that artists' oil paints actually comply with all the requirements of this Commercial Standard, it is recommended that manufacturers include the following statement in conjunction with their name and address on labels, invoices, sales literature, etc.

This artists' oil paint complies with Commercial Standard CS98-62, as developed by the trade, under Commodity Standards Procedures, and issued by the U.S. Department of Commerce.

The following abbreviated statement is suggested when available space on labels is insufficient for the full statement:

Conforms to CS98-62.

APPENDIX I (1942)

SPONSORS' NOTES ON THE COMMERCIAL STANDARD FOR ARTISTS' OIL PAINTS

By R. J. GETTENS and F. W. STERNER

Serious painters have long been concerned with the permanence of colors, and they have realized that no matter how true and deep their inspiration and how perfect their technical skill, the real value of their work is inextricably bound to the chemical and physical stability of the materials they use. For years, scattered individuals and groups have been especially interested in the technical problems of the artist, and they have contributed much to our knowledge of the permanence of painting materials. In years past, the books of A. H. Church, A. Eibner, A. P. Laurie, F. W. Weber, and Maximilian Toch have influenced a considerable number of painters: more recently, the writings of Max Doerner, and Ralph Mayer's recently published "Artists' Handbook of Materials and Techniques," have brought the artist up-to-date information. In Germany some decades ago, a few artists' societies, particularly the German Society for the Promotion of Rational Methods in Painting, in Munich, sought to establish a limited and permanent palette, and at various congresses and sittings of commissions held in Germany over a period of many years, resolutions were passed covering the nomenclature, labeling, and quality of artists' oil paints. The Royal Academy of Arts and other societies in England have been active along similar lines. Here in America, Edward W. Forbes, of Harvard University, and others have stimulated interest in techniques and in permanent painting materials. Some years ago Martin Fischer, of Cincinnati, published a book, "The Permanent Palette," in which he listed a restricted number of pigments that he believed to be permanent. The American Artists' Professional League realized the value of such information and gave its support to the views of Dr. Fischer. Wilford S. Conrow, national secretary of the league, pointed out at the general conference that, through the distribution of pamphlets, the inducement of some manufacturers to declare the chemical composition of paints on tube labels, and the sponsorship of chemically sound painting techniques, the league has promoted the use of pigments recommended as permanent. All these efforts, individual and collective, have been important steps in furthering the cause of permanent painting and have been of great value in laying the groundwork for the Commercial Standard.

This Commercial Standard seeks not only to arouse interest in materials for permanent painting but also to enable the artist to procure those materials. It sets up specifications for paints which are intended to assure the artist who buys them that he is getting a definite product which can be expected to have reasonable, if not excellent,

permanence, provided it is used correctly. It is felt that the standard will eliminate the outright poor material that so often masquerades as high-quality paint.

The standard does not attempt to define or to guarantee the production of perfect paints because such paints have never existed and no one could recognize them if they had. There is general agreement, based on experience gained from centuries of use, that certain ingredients used in paints are good and permanent, that some are acceptable within limitations, and that others are bad. There is much disagreement, however, among authorities about a great many paint materials because their application has not been sufficiently studied; for these, judgment will have to be reserved until reliable data are produced. One great difficulty is that final evaluation of the lasting qualities of artists' paints often cannot be made until many years after they are applied.

It is not intended that paint produced under the standard by different manufacturers shall be exactly the same in composition and in working qualities. The manufacture of paints is a complicated process, and is perhaps, even today, more of an art than a science. Methods of manufacture must necessarily vary among different firms. The product must satisfy those who are employing a wide variety of techniques. Artists may prefer one brand to another because of slight differences in working quality, consistency, color, and composition allowed under the terms of the standard.

When this standard was first proposed, it covered two grades of paint: An artists' grade, and a students' grade, based on differences in tinting strength; but, after much consideration, it was decided that the standard should cover only a single grade of high standard or "artists' grade" paint. Establishment of two grades would have led to much unnecessary confusion, not only for the manufacturer, but for the artist. It was felt that this standard was primarily for the benefit of the professional painter who was desirous of producing permanent works of art, and, furthermore, that it would be difficult to make any practical distinction between the two grades on the basis of tinting strength alone. It might have been possible with paints which contain expensive pigments but not with those which contain iron oxide or the earth colors.

The section on vehicles may call for some explanation. In the standard, the vehicles are limited to linseed oil or poppy-seed oil because these seem to have, to a greater extent than other drying oils, the desirable properties required in an artists' oil medium. No other oils have become well enough established for artists' purposes to be included, but when it can be demonstrated that there are other drying oils which are equal or superior, their inclusion in the standard may be considered by the standing committee. It has been suggested that the kind of vehicle used in artists' paints be printed on the label, but, since the vehicle in paints covered by the standard is definitely limited to these two oils, that does not seem necessary. If manufacturers wish, however, to designate on the label the kind of drying oil used, whether linseed or poppy seed, the information would be much welcomed by artists.

There is also the difficult question concerning the direct incorporation of driers in prepared pigment pastes. Some artists are strongly against it. It is argued, however, with considerable justification, that

the manufacturer can incorporate a drier more scientifically than can the artist. It is much better for the manufacturer to adjust the drying qualities of paints with minimum amounts of metallic driers than it is for the artist to do it by rule-of-thumb addition of siccativ or varnish. It is felt that the limited amounts of driers permissible under the standard can cause no harm.

Inerts, fillers, and bodying agents, including metallic soaps and waxes, are allowed in minimum amounts in paints covered by the standard (see para. 4.9 and 4.10). This is done because it is often necessary to incorporate limited amounts of such materials in order to insure proper keeping qualities and satisfactory working characteristics. From laboratory observations there appears to be no sharp borderline between legitimate additions of inerts, fillers, and bodying agents to attain certain desirable qualities on the one hand and adulteration on the other. Although amounts of these materials allowable are not directly specified, indiscriminate use of them is limited by the high standards for tinting strength.

The standard does not attempt to set up a limited palette nor does it prescribe pigments that are to be used. The pigments listed under the glossary of terms include a fairly wide range in respect to color and composition, and they have been selected on the basis both of permanency and of usage. These pigments have been divided into two light-fastness test groups, I and II. Group I includes pigments which will not fade or change color when exposed to 600 hours of direct summer sunlight. If a pigment can withstand even this minimum exposure without change, it is felt that it will give altogether satisfactory performance in paint films intended for indoor exposure. The smaller group, II, covers a few pigments which do not have high permanency to long exposure in direct sunlight yet which, in diffuse light, are comparable in permanency to the pigments listed in group I. They include pigments like strontium yellow and vermilion, which are commonly used by artists because of their desirable color qualities. Pigments included in group II must be permanent enough, however, to resist fading or color change after exposure to 300 hours of direct summer sunlight.

Special mention should be made about the nomenclature used in the glossary of terms for cadmium yellow and red pigments (p. 3 of the standard). Distinction is made between chemically pure (cp) cadmium sulfide and cadmium sulfoselenide (cadmium yellow and cadmium red) and these same materials coprecipitated with barium sulfate (called cadmium-barium yellow and red). This distinction is not made because there are great differences in color, purity, and permanency between the two classes of cadmium pigments but primarily because of the differences in tinting strength and the very considerable differences in cost. The cadmium barium pigments are much less expensive to make than the cp cadmium. "Chemically pure" is used here in its technical sense. When applied to a pigment, the term means that it contains no intentionally admixed inert and is not fortified with a dyestuff, but it does not mean that it is 100 percent pure. Some commercial cadmium yellows and reds, however, are better than 99.5 percent pure cadmium compounds, but cp cadmium yellow, light often contains a certain percentage of zinc sulfide to bring the cadmium yellow to proper value.

Ultimately, it would be desirable to have the quality of all pigments listed in the glossary of terms specified on a percentage basis of actual color ingredient. Harmful or undesirable impurities, like free sulfur or soluble sulfides in sulfide pigments, should be ruled out. Tolerance of noncoloring materials and inerts could be stated. This designation of the purity of pigments is a matter that might well come up for future consideration by the standing committee for the standard.

There has been some demand that more detailed information about paint composition be required on the label of the paint tube. It has been suggested that this include:

- (a) Chemical composition of the pigment.
- (b) Identity of all vehicular components.
- (c) Indication of the presence and amount of driers, inerts, and bodying agents.
- (d) Percentage composition of all components.
- (e) Volumetric contents of the package (tube).

If the manufacturer wants to supply all this information directly on the tube label, it would be welcome and nothing in the standard is intended to prevent him from doing so. The amount of information, however, that can be printed on the label of a studio-size tube is limited, and the printing of so many details would add to selling costs and would impose inflexibility in formulation. It is felt that a simple statement on the tube that the product conforms to all specifications in the standard is sufficient to indicate the quality and the contents.

APPENDIX II (1962)

NOTES ON COMMERCIAL STANDARD CS98-62 FOR ARTISTS' OIL PAINTS

By RALPH MAYER

The original sponsors of this standard, R. J. Gettens and F. W. Sterner, considered all of the major problems involved in the technology of artists' oil colors, especially those which are concerned with standards of working qualities, of purity, and above all of stability or permanence, which is one of the basic influences in the longevity of paintings. It is therefore a most important element in the perpetuation of our cultural assets. Although in the recent past the technology of artists' paints and paintings has not been accorded the attention it deserves, especially from a scientific or laboratory standpoint, the field has not been entirely neglected. Paint technology as it relates to the practice of painting can boast of an extensive literature that covers all periods in the history of art, and of some scientific data that has been taken and adapted from researches in the field of industrial paint chemistry and from museum technology. But the amount of such scientific data on the subject is relatively small.

Our principles of rational painting procedures are based mainly on experience gained from centuries of use; these have led to general agreements that certain ingredients used in paints are good and permanent, that some are acceptable within limitations and that others are bad. There is disagreement about a great many materials that have been insufficiently studied, and until scientific data is available on these we are guided by consensus of opinions. Most of these matters were noted in the first edition of this standard where it was also observed that perfect paints have never existed, and no one could recognize them if they had. Therefore the standard does not attempt to define or guarantee the production of perfect paints. Specifications were set up in order to assure the artist who buys each tube that he gets a definite product, and that he can expect the paint to conform to the norm of good working qualities and to have reasonable, if not excellent permanence.

It was never intended that paint produced by all the manufacturers be exactly the same in composition or working qualities, for the manufacture of artists' oil colors is a complex procedure, and, is perhaps even today as much an art as it is a science. Methods of manufacture and choice of ingredients must necessarily vary among different firms. The product must satisfy a great variety of techniques and many purposes because it is employed by widely divergent schools of painters and must be capable of being adjusted to many uses; the specifications were designed to fulfill these requirements. Artists may prefer one brand to another because of the appreciable

differences in working quality, consistency and color allowed within the overall limits of the standard.

At one time it was planned to establish hue tolerances, that is, to set up limitations on the color properties of the various pigments, but after much detailed work on all the pigments this plan was discarded as impractical and undesirable. The modern manufacturer of oil colors is well aware of the standard types to which a top-grade pigment must conform, and the artist makes his choice among competitive brands on hue comparisons, more than any other consideration. This serves as an automatic check to keep the various brands in line. For instance, one may find quite a few variations of cadmium yellows, the fact that one maker's medium may be close to another's deep, simply serves to make available to the users a wider range of nuances within a general type.

The oils were originally limited to the two most widely used, linseed and poppy seed. No other oils had been sufficiently studied on a modern scientific basis for the committee to come to agreements. Such oils as walnut oil and safflower oil may in the future prove to be their equal or superior but until such time as their relative values as applied to artists' purposes are definitely established, they are not included in the standard. At the present writing, safflower oil is considered to be of great promise because of the result of experiences in the industrial paint field. Poppy-seed oil is generally held to be inferior to linseed oil on all significant points; its principal use in most modern oil colors is in the addition of small percentages to improve the consistency of some linseed oil colors. The use of straight poppy-seed oil as vehicle is admissible under the standard.

Special mention must be made on the official nomenclature. Cadmium-barium red and yellow are names devised by the committee in 1941 to distinguish between pure cadmium sulphides or selenides and those which are coprecipitated with barium sulphate. The latter are perfectly acceptable pigments for artists use. They have somewhat lower tinctorial power than the so-called "CP" cadmiums and they are appreciably cheaper.

Twenty years after the inception of the Commercial Standard, some of its valuable effects can be listed as follows: First, practically overnight, following its promulgation, it abolished the extreme confusion in nomenclature which has plagued artists for centuries. Formerly it was not uncommon for a single pigment to be known by several names and for several pigments to be known by the same name. The present situation is so felicitous that all are urged to maintain it, and to discourage the use of fancy names, proprietary appellations and synonyms for any pigment on the approved list. Whenever such are used on a label, no matter how good the contents may be, that tube should be considered nonstandard. Item number 3 of paragraph 5.2.1 which permits manufacturers to use a proprietary or "fancy" name for phthalocyanine blue (and green) is a special exception. It was made necessary by the circumstances surrounding the introduction and acceptance of the pigment during the period following its invention in 1935, not only because of its unwieldy name, but also because of the established use and prominence achieved by so many of its trademark synonyms during these years.

The standard, which applies to one grade only (the best grade), has put the second grade, and the student's grade colors, in their proper places. Although the cheaper paints may serve useful purposes, the fact that none but standard grade colors should be used by the creative painter for works of artistic merit, has been emphasized and made clear. The poor product, which formerly masqueraded as first class material, is now disclosed for what it is.

Membership on the standing committee has not been strictly limited to the list of names given herein. Any bona fide manufacturer of first-grade professional artists oil paints may apply for representation, whether they have accepted the standard and use its guarantee on their labels or whether they do not. Representatives of manufacturers in foreign countries may also take part in these meetings but they may vote only if they are acceptors and use the guarantee on their tube labels.

There has been some demand that more detailed information about paint composition be required on the label of the paint tube. It has been suggested that this include:

- (a) Chemical composition of the pigment.
- (b) Identity of all vehicular components.
- (c) Indication of the presence and amount of driers, inerts, and bodying agents.
- (d) Percentage composition of all components.
- (e) Volumetric contents of the package (tube).

If the manufacturer wants to supply all this information directly on the tube label, it would be welcome and nothing in the standard is intended to prevent him from doing so. The amount of information, however, that can be printed on the label of a studio-size tube is limited, and the printing of so many details would add to selling costs and would impose inflexibility in formulation. It is felt that the present simple statement on the tube that the product conforms to all specifications in the standard is sufficient to indicate the quality and the contents.

HISTORY OF PROJECT

First Edition.—On October 20, 1938, the Massachusetts Art Project, WPA, reported to the National Bureau of Standards that conditions surrounding the purchase of artists' oil paints of good quality were unsatisfactory and that paints purchased were often misnamed and did not contain the pigment the name indicated. The letter requested the establishment of a Commercial Standard along the lines of other Commercial Standards established by the National Bureau of Standards.

A tentative draft of a proposed Commercial Standard was prepared by F. W. Sterner, technical director, and R. J. Gettens, consultant, of the Paint Testing & Research Laboratory, whereupon the National Bureau of Standards conducted a preliminary conference of manufacturers with representatives of the Paint Testing & Research Laboratory in Boston on April 14, 1939. After adjustment of the tentative draft by the preliminary conference, and through subsequent correspondence, a general conference was called and held at the Museum of Modern Art in New York City on February 9, 1940.

The general conference, attended by 85 representatives of art organizations and paint firms, remained in session all day and well into

the early part of the evening, and made a number of modifications in the requirements of the proposed standard. Some questions remained unsettled and were referred to a special committee composed of three artist representatives and three manufacturers.

The special committee met in New York City on April 30, 1940, and completed the tasks assigned to it by the general conference. The recommended Commercial Standard as adjusted was circulated to the entire industry for acceptance on August 16, 1940.

A large number of acceptances from both users and producers was received, but some comment led the special committee to believe some further adjustment of the specification was desirable. Accordingly, a second meeting of the committee was held in New York City on May 16, 1941. The second edition of the recommended Commercial Standard as finally adjusted was circulated for acceptance on August 15, 1941, and on February 10, 1942, the National Bureau of Standards announced that acceptances representing a sufficient volume of business had been received and that the standard would be effective for new production from May 10, 1942.

Amendment.—After approval by the standing committee, the Commodity Standards Division issued an amendment to CS98-42 on January 1, 1952. The amendment covered modification of tables 1 and 2 and paragraph 22c. It also included a new table 3 covering tinting strength standards.

First Revision.—During the period 1952-1960 a number of suggestions were received from interested organizations recommending that the Commercial Standard be revised to bring it in line with developments within the industry, particularly with reference to new materials under study.

On March 8, 1960, a meeting of the standing committee was held in the offices of the New York City Field Office of the U.S. Department of Commerce. All members of the committee were invited together with other industry representatives. The committee appointed a new chairman and a number of new members to replace those who were no longer active in the industry.

A summary of material to be included in a proposed revision of CS98-42 was approved by the committee together with the stipulation that further refinements and additions to the proposal would be reviewed and approved by the chairman and Mr. Gettens.

Following approval of the final draft of the proposed revision by those representing the standing committee and by the National Bureau of Standards, the recommended revision of CS98-42 was circulated to all segments of the industry on July 20, 1962, for consideration and acceptance. Prior to issuing an announcement of the success of the project, several editorial adjustments were made in the recommended revision. On October 15, 1962, the Commodity Standards Division announced that acceptances representing a favorable cross section of the industry and sufficient to warrant publication had been received. The revised Commercial Standard, designated Artists' Oil Paints, CS98-62, is effective November 15, 1962.

Project Manager: H. A. Bonnet, Commodity Standards Division, Office of Technical Services, U.S. Department of Commerce.
Technical Advisor: Kenneth L. Kelly, Metrology Division, National Bureau of Standards.

STANDING COMMITTEE

The function of the Standing Committee is to review, prior to circulation for acceptance, changes proposed to keep the standard abreast of progress. Comments concerning the standard and suggestions for revision may be addressed to the Commodity Standards Division, Office of Technical Services, U.S. Department of Commerce, which acts as secretary for the Committee, or to any of its members listed below:

- RALPH MAYER, 207 West 106th Street, New York, N.Y. (chairman)
 HERB AACH, American Artists' Color Works, 100 East Diamond Avenue, Hazleton, Pa.
 LEONARD BOCOUR, Bocour Artists' Colors, Inc., 500 West 52d Street, New York, N.Y.
 WILLIAM M. BOSMAN, Talens & Co., Union, N.J.
 P. B. COTT, National Gallery of Art, Washington, D.C. 42-62/-100
 DR. R. L. FELLER, Mellon Institute, 4400 Fifth Avenue, Pittsburgh 13, Pa.
 MITZI GALLANT, Artists' Equity Association, 150 Fifth Avenue, New York, N.Y.
 R. J. GETTENS, Freer Gallery of Art, Smithsonian Institution, Washington, D.C.
 HENRY W. LEVISON, President, Permanent Pigments Inc., 2700 Highland Avenue, Norwood 12, Ohio.
 MRS. BENA F. MAYER, administrative assistant, The Artists Technical Research Institute, Inc., 116 East 16th Street, New York, N.Y.
 WILLIAM A. McCLOY, chairman, Department of Art, Connecticut College, Mohegan Avenue, New London, Conn.
 WILLY NUSINOFF, M. Grumbacher, Inc., 460 West 34th Street, New York 1, N.Y.
 CHARLES RANGER, Devoe & Reynolds Co., Inc., Box 328, Louisville, Ky.
 E. RESS, Art Material Trade News, 119 West 57th Street, New York, N.Y.
 A. V. RICHARDSON, president, J. H. Hatfield Co., 873 Washington Street, Canton, Mass.
 ERWIN M. RIEBE, president, Nobema Products Corp., 141 Greene Street, New York 12, N.Y.
 F. W. WEBER, F. WEBER Co., 1220 Buttonwood Street, Philadelphia 23, Pa.
 PHILIP REISMAN, Artists' Equity Association, 4 West 18th Street New York 11, N.Y.

Color Labs

P.O. Box 1266

Yellandale, Fla. 33009

Henry Levison

ACCEPTORS

The manufacturers, distributors, users and others listed below have individually indicated in writing their acceptance of this Commercial Standard prior to its publication. The acceptances indicate an intention to utilize the standard as far as practicable but reserve the right to depart from it as may be deemed desirable. The list is published to show the extent of recorded public support for the standard, and should not be construed as indicating that all products made by the acceptors actually comply with its requirements.

Products that meet all requirements of the standard may be identified as such by a certificate, grademark or label. Purchasers are encouraged to require such specific evidence of compliance, which may be given by the manufacturer whether or not he is an acceptor.

ASSOCIATIONS

(General Support)

American Institute of Architects, Washington, D.C.
Artists' Equity Association, New York, N.Y.
National Art Education Association, Washington, D.C.

FIRMS AND OTHER INTERESTS

Alabama, University of, Department of Art, University, Ala.
American Artists' Color Works, Inc., Hazleton, Pa.
Amherst College, Department of Fine Arts, Amherst, Mass.
Arlington State College, Art Department, Arlington, Tex.
Artist and Display Supply Co., Milwaukee, Wis.
Artists Technical Research Institute, Inc., The, New York, N.Y.
Atkinson, Eugene, Portrait Painter, Flushing, N.Y.
Braden Sutphin Ink Co., Cleveland, Ohio.
Bruce Museum of Natural History, History and Art, The, Greenwich, Conn.
Bryn Mawr College, Bryn Mawr, Pa.
Chicago, University of, Department of Art, Chicago, Ill.
Cincinnati Art Club, The, Cincinnati, Ohio.
City Art Museum of St. Louis, St. Louis, Mo. (general support)
Columbia University, New York, N.Y.
Connecticut College, Department of Art, New London, Conn.
Craftint Manufacturing Co., The, Cleveland, Ohio
East Texas State College, Art Department, Commerce, Tex.
Freer Gallery of Art, Smithsonian Institution, Washington, D.C.
Ghidden Co., The, Graphic Arts Division, Cleveland, Ohio.
Grand Rapids Art Gallery, Grand Rapids, Mich. (general support)
Grumbacher, M., Inc., New York, N.Y.

Hatfield, J. H., Co., Canton, Mass.
Hirzel, Charles K., American Institute of Architects, New York, N.Y. (general support)
Hogroian, Mrs. Ferdinanda E. Zegel, Arlington, Va.
Hunter Associates Laboratory, Inc., McLean, Va.
Hunter College, New York, N.Y.
Isabella Stewart Gardner Museum, Boston, Mass.
Kansas, University of, Department of Drawing and Painting, Lawrence, Kans.
Kooser, Edwin deTurck, Artist, Somerville, N.J.
Layton School of Art, Milwaukee, Wis.
Macy's Bureau of Standards, New York, N.Y.
Mellon Institute, Pittsburgh, Pa.
New York University, Institute of Fine Arts, New York, N.Y.
Nobema Products Corp., New York, N.Y.
Ohio University, School of Painting and Allied Arts, Athens, Ohio.
Oregon State University, Department of Art, Corvallis, Oreg.
Permanent Pigments Inc., Norwood, Ohio.
Rawmexim Corp., New York, N.Y.
Ringling School of Art, Sarasota, Fla.
Sam Houston State College, Department of Art, Huntsville, Tex. (general support)
San Francisco Museum of Art, San Francisco, Calif.
Sears, Roebuck and Co., Chicago, Ill.
Southwestern Institute of Arts, Shreveport, La.
Stanford University, Department of Art and Architecture, Stanford, Calif.
Studio for Instruction in Drawing and Painting, Boston, Mass.
Studio of Walter McDonald, Texarkana, Tex.
Union Free School District No. 5, Levittown, N.Y.
Weber's Arts & Crafts Supplies, Denver, Colo.
Weltzin, J. F., Artist, Moscow, Idaho.

Williams, C. K. & Co., Easton, Pa.
Winsor and Newton, Inc., New York, N.Y.
Wisconsin, University of, Department of Art
and Art Education, Milwaukee, Wis.

U.S. GOVERNMENT

Atomic Energy Commission, Property and
Supply Management Branch, Washington,
D.C.

Department of Health, Education, and Wel-
fare, Procurement and Supply Manage-
ment Branch, Washington, D.C.
Department of the Interior, Division of
Property Management, Washington, D.C.
United States Air Force, Standardization
Branch, Materiel Services Division, Direc-
torate of Materiel Management, Brookley
Air Force Base, Ala.

OTHER COMMERCIAL STANDARDS

A list of Commercial Standards may be obtained from the Com-
modity Standards Division, Office of Technical Services, U.S. Depart-
ment of Commerce, Washington 25, D.C. This list includes the pur-
chase price of the publication and directions for ordering copies.

WITHDRAWN

CS98-62 Artists' Oil Paints

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this Commercial Standard.

Date _____

Commodity Standards Division
Office of Technical Services
U. S. Department of Commerce
Washington 25, D. C.

Gentlemen:

We believe that this Commercial Standard constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production¹ distribution¹ purchase¹ testing¹
of this commodity.

We reserve the right to depart from the standard as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Signature of authorized officer _____
(In ink)

(Kindly typewrite or print the following lines)

Name and title of above officer _____

Organization _____

Street address _____
(Fill in exactly as it should be listed)

City, zone, and State _____

¹ Underscore the applicable words. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interest, trade associations, trade papers, etc., desiring to record their general support, the words "General support" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial Standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of Commercial Standards is to establish, for specific commodities, nationally recognized grades or consumer criteria, and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the standard, where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function, performed by the Department of Commerce in the voluntary establishment of Commercial Standards on a nationwide basis is fourfold: First, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or of the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.